JUNXI YAN

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EDUCATION

Tsinghua University, *Undergraduate* Beijing, China
B.S. in Computer Science and technology | B.S. in Economics Sep. 2021 – Present

- GPA: 3.7/4.0
- Research Interest: Natural Language Processing, LLM Tool Learning and LLM-driven AI Agent; LLM Efficient Training and Knowledge Acquisition; Natural Language Inference, LLM reasoning;

PUBLICATIONS

1. Yujia Qin, Shengding Hu, …, **Junxi Yan**, …, Tongshuang Wu, Heng Ji, Zhiyuan Liu, and Maosong Sun. Tool Learning with Foundation Models. *ACM Computing Survey 2024.*
2. Zhuocheng Gong, Ang Lv, Jian Guan, **Junxi Yan**, Wei Wu, Huishuai Zhang, Minlie Huang, Dongyan Zhao, Rui Yan. Mixture-of-Modules: Reinventing Transformers as Dynamic Assemblies of Modules. *EMNLP 2024.*

RESEARCH EXPERIENCE

COAI Lab, Tsinghua University Beijing, China
Undergraduate Research Assistant to Prof. Minlie Huang Feb. 2024 – Jul. 2024

➢ **Mixture of Modules:**

- Proposed a Mixture-of-Modules (MoM) Transformer architecture that dynamically selects attention and feed-forward modules, breaking the traditional depth-ordered computation approach.
- Enabled deeper computation graphs, reduces TFLOPs compared to vanilla Transformers, and maintains competitive performance.

THUNLP, Tsinghua University Beijing, China
Undergraduate Research Assistant to Prof. Zhiyuan Liu Aug. 2022 – Jan. 2024

➢ **LLM-driven AI agent (XAgent):**

- Released XAgent, an autonomous agent for complex task solving with enhanced consistency, stability, and human-agent interaction.
- Utilized Docker container to design a secure tool-system, enabling the agent to utilize and incorporate various tools within a protected environment.
- Designed datasets and trained the SFT model ***ObjectLlama***, empowering the agent with tool invocation capabilities comparable to GPT-4.
- Designed diverse project application scenes, conducting benchmark tests and addressing real-world tasks.

➢ **Tool learning with foundation models:**

- Comprehensive study.
- Formulated a standardized framework for tool learning with foundation models, culminating in the development of the BMTools toolkit by standardizing and automating the process of tool invocation.
- Conducted experiments and case studies under various scenarios including image generation, speech-to-text, and language translation, to validate the efficacy of the proposed framework.

NLP X Lab, Georgia Institute of Technology
Visit Student to Prof. Alan Ritter Jul. 2024 – Present

➢ **Cost-Efficient Fine-Tuning with LLM:**

- Proposed a cost-efficient fine-tuning method under a fixed budget, providing new insights for NLP practitioners facing high data annotation costs.

Tsinghua University (Department of Computer Science and Technology) Beijing, China
Team member of the Software Engineering course. Mar. 2023 – June. 2023

➢ **Instant messaging system(DMail):**

- Built a mature instant messaging system product in the span of one semester. Explored the feasibility of deploying a personal communication system anytime, anywhere, and delved into the rules and boundaries that software engineering projects should adhere to.
- Selected the best project for the Spring 2023 Software Engineering course.

ADDITIONAL INFORMATION

Additional Professional and Extracurricular Experiences

- Member of Student Association for Science and Technology. Organized dozens of school - level science and innovation events, including but not limited to the Tsinghua University Big Idea Challenge, the THU Challenge Cup Academic Competition and the THU Drone Competition.
- Member of the Basketball Representative Team of SEM (School of Economics and Management). Won the 2022 THU Ma Yuehan Cup championship, the first championship in the past 16 years.

Language Skills

- TOEFL 104/120 (Reading 30, Listening 28, Speaking 23, Writing 23)
- Basic knowledge of Greek; Completed the course Greek (Second Foreign Language)

Technique Skills

- Proficient in C/C++, Python, JavaScript, Linux, Latex, Stata.
- Familiar with various neural networks and state-of-the-art deep learning techniques.